Installation Manual

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※ This installation manual is subject to change without notice for quality improvement.

Installation Manual

1 Precautions for safety

The instructions provided in this installation manual include important information for safe use of this product. Failure of complying with those instructions may result in death, severe injury, or tremendous loss of property.

The instructions for safe use are classified into '**Danger**', '**Warning**', '**Caution**' by the degree of danger, which respectively contains the following meaning.

⚠ Danger	Violation of instructions may cause a seriously dangerous situation such as death or a severe injury
⚠ Warning	Violation of instructions may cause a potentially dangerous situation such as death or severe injury.
⚠ Caution	Violation of instructions may cause a potentially dangerous situation such as a light or half-serious injury.
Attention	Violation of instructions may cause a situation such as a property loss, product malfunction, or deteriorated performance.

1) The symbols provided in the product and the installation manual contains the following meaning.

⚠ This symbol implies that "precautions" shall be taken against a possibility of a personal injury under a specific condition.

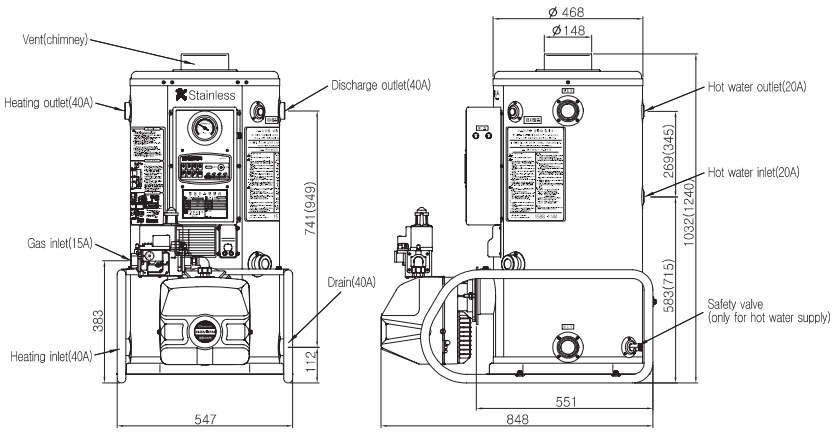
⊘ This symbol implies that a "prohibition" shall be made against a possibility of a personal injury or a property loss under a specific condition.

❗ This symbol implies that the instructions shall be complied with.

2) The warnings and cautions specified in the installation manual do not include all the possible safety precautions to be taken for using the product. Consequently, utmost care shall be taken for safety during use of the product.

2 Outside drawing of the boiler

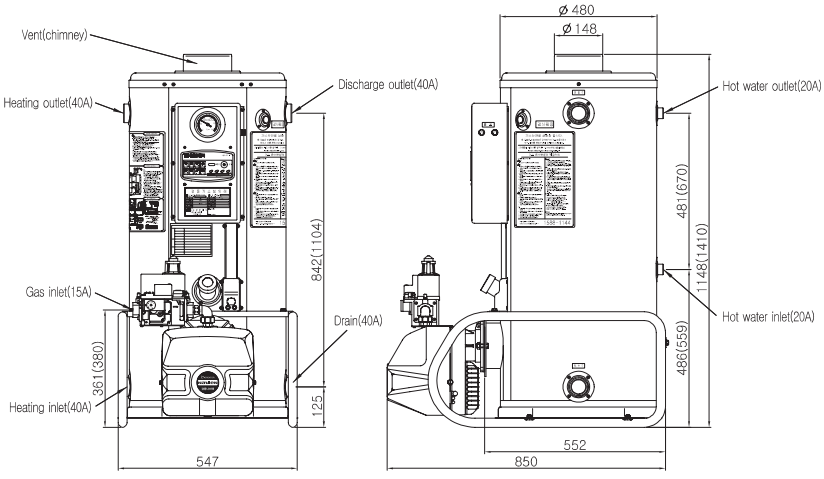
■ Model no.: KDB-535GTD, GTS, GTG



※ The sizes in the blank "( )" are applied to the model no..

※ A dedicated boiler (GTS, GTG) is not supplied with the hot water inlet and outlet on the rear of the boiler.

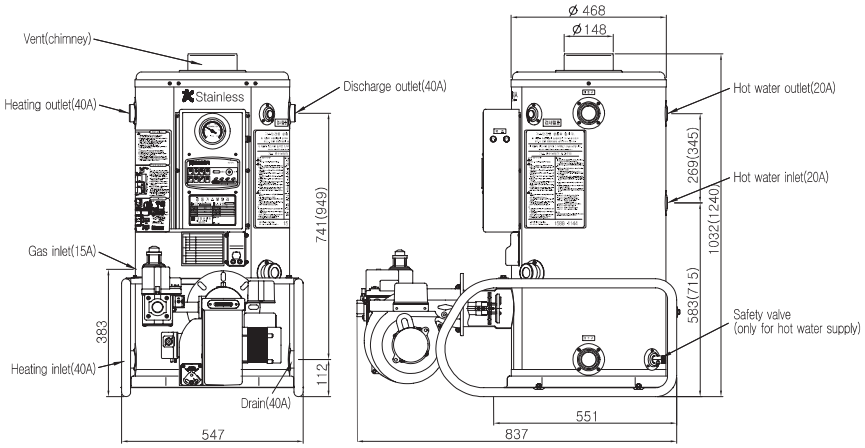
■ Model no.: KDB-535GPD, GPS



※ The sizes in the blank "( )" are applied to the model no.

※ A dedicated boiler (GPS) is not supplied with the hot water inlet and outlet on the rear of the boiler.

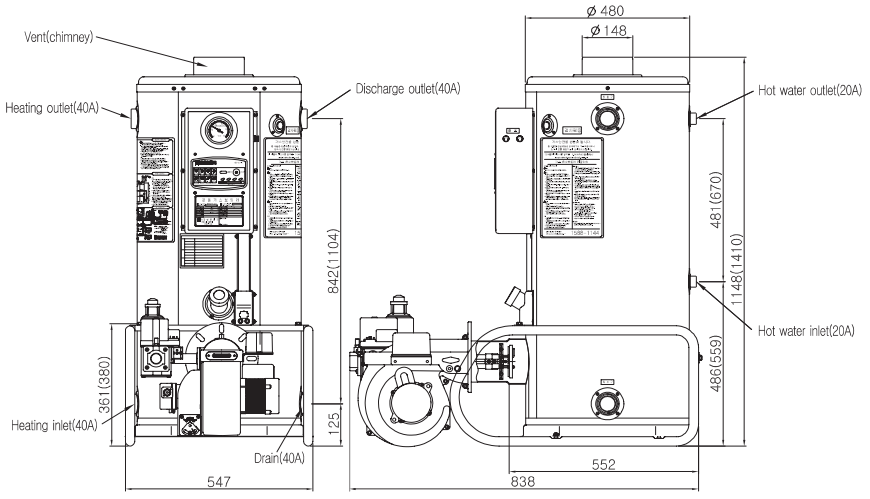
■ Model no.: KDB-735GTD, GTS, GTG



※ The sizes in the blank "( )" are applied to the model no..

※ A dedicated boiler (GTS, GTG) is not supplied with the hot water inlet and outlet on the rear of the boiler.

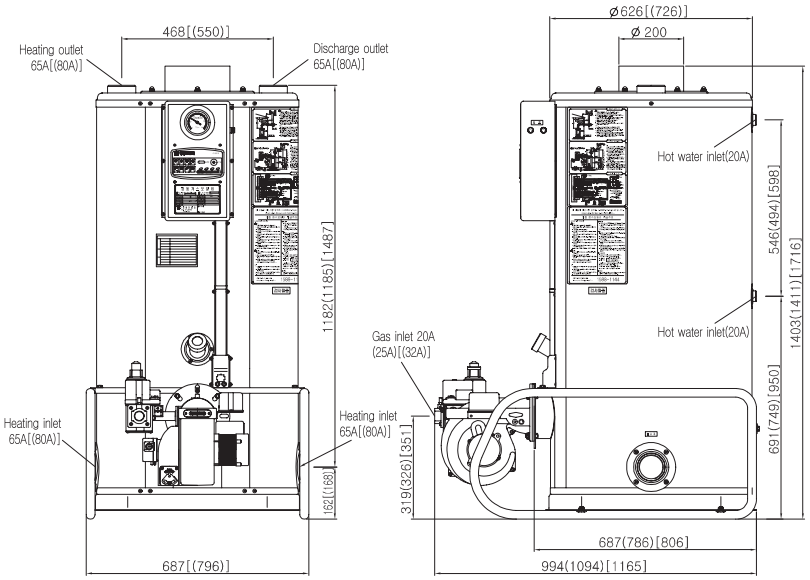
■ Model no.: KDB-735GPD, GPS



※ The sizes in the blank "( )" are applied to the model no.

※ A dedicated boiler (GPS) is not supplied with the hot water inlet and outlet on the rear of the boiler.

■ Model no.: KDB-1035GPD, GPS, GPG
1535GPD, GPS, GPG
2035GPD, GPS, GPG



※ The sizes in the blank "( )" are applied to the model no. 1535, and those in the bracket "[ ]" are to the model no. 2035GPD, GPS, GPG.

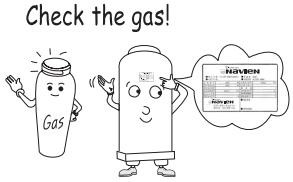
※ A dedicated boiler (GPS, GPG) is not supplied with the hot water inlet and outlet on the rear of the boiler.

3 Safe and correct installation method

After completion of installation, be sure to return the user's (installation) manual to the user.

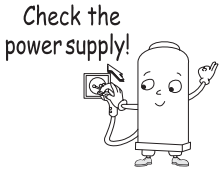
Before installation

⚠ Warnings



Be sure to check the gas to be used in the installation place, prior to installation.

- Use of the gas, other than the one specified on the name plate on the front of the boiler, may result in a fire or explosion.



Be sure to check the power supply gas to be used in the installation place, prior to installation.

- The power supply, if higher or lower than the one specified on the front of the boiler, may cause a fire.

Selection of the installation place

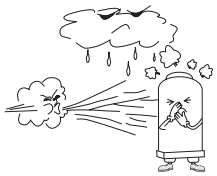
After reading the following instructions, install the product in a safe and correct way as specified in the instructions.

⚠ Warnings



Never install the boiler in a place with inflammable objects.

- Highly inflammable materials, such as volatile oil or alcohol, may cause a fire during ignition of the boiler.



Install the boiler in a boiler room free froml the impact of rain and wind.

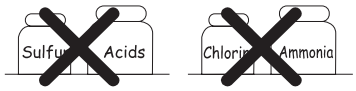
- Incomplete combustions, resulting from rain and wind, may eventually lead to a carbon oxide poisoning.

⚠ Warnings



Never install the boiler in a moist or enclosed place such as a bathroom, a toilet.

- Incomplete combustion, caused by oxygen deficiency, may lead to a carbon oxide poisoning.
- Installation in the above place may also cause earlier product malfunctions.



Never install the product with corrosive gas such as ammonia, chlorine, sulfur, acids.

- Corrosive gas may damage the boiler and cause incomplete combustion, eventually leading to a carbon oxide poisoning.

Other considerations

Never install the boiler in the following areas.

- Do not install the boiler near the electric equipment.
- Do not install the boiler in an uneven or unstable place.
- Do not install the boiler in a place with highly combustible materials.
- Do not install the boiler in a place inadequate for safe gas piping installation.
- Do not install the boiler in a place with special chemical agents (generating combustible or corrosive gas).
- Do not install the boiler in a place where it is difficult to get access to the stairway or the exit for escaping.
- Do not install the boiler in a place which is not well drained.
- Do not install the boiler below the shelf with unstable objects.
- Do not install the boiler in a place where it is difficult to conduct maintenance of the boiler after installation.
- Do not install the boiler in a place with noise and air pollution.
- Do not install the boiler in a place where the wind generated from a vent, a range, and a hood have an impact on the air intake and exhaust.
- Do not install the boiler in a place which is not well-ventilated.
- Do not install the boiler in a place with strong wind.
- Do not install the boiler in a place where it is difficult to install the chimney pipe (chimney).

Be sure to install the boiler in a sufficient place for check up and repair of the boiler.
A space of more than 1m shall be provided in front of the boiler, in order to perform maintenance and checks.

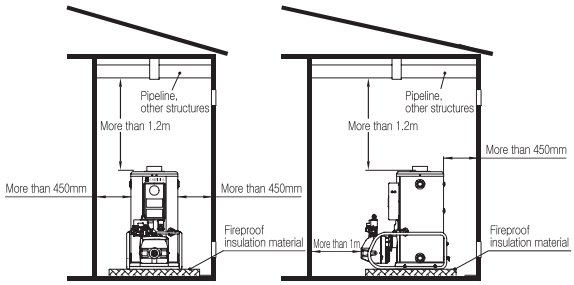
Boiler installation method

- Install the boiler on the surface with a structure capable of enduring the load of the boiler (weight). (Refer to the specifications presented in the user's manual.)
- Install the boiler in a horizontal, upright position so that the boiler does not lean toward one side.
- Installation shall be made for the front side of the boiler to face forward.
- Install the boiler to be fixed on the floor, in order to prevent vibration during operation.
- Sufficient light shall be provided with the boiler room in order to help to observe the boiler equipment by sight and offer the after-sales service for the equipment.

Precautions for boiler installation in a dedicated boiler room

- Be sure to install the boiler in the dedicated boiler room. (The boiler room shall be designed so that the gas emitted from the boiler does not flow into the living room, and the wall between the boiler room and the living room shall be made of the fireproof materials, except for the entrance / exit door.)
- The dedicated boiler room shall not be equipped with the ventilating fan which causes the negative pressure (the pressure lower than the atmosphere pressure).
- The dedicated boiler room shall not be equipped with the exhaust duct of the gas range (hood) which leads to air flowing in and out of the living room and the kitchen.
- Installation of the boiler shall not be made nearby the place for storage and treatment of the combustible or inflammable objects. A sufficient space shall be provided for boiler installation as presented in the following figure, in order to perform the control, combustion, check-ups and repair of the boiler.
- The top of the boiler body shall be kept at least 1.2m away from the structures such as the ceiling and the piping.
- The boiler body shall be kept at least 450mm away from other structures such as the wall and the piping on the side of the boiler.
- The front of the boiler shall be kept more than 1m away from the structures in front of the wall.

The boiler shall be kept away from the nearby combustible objects, as illustrated in the following figure.

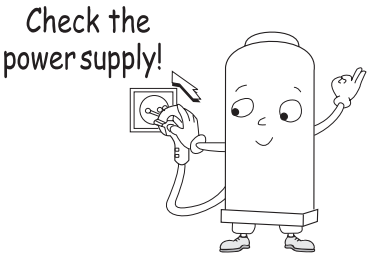


Precautions for installation of the boiler in the outdoors

- Appropriate facilities such as the casing shall be equipped with the boiler to prevent the rain from permeating into the boiler.
- The waterproof treatment shall be applied to the exposed insulation materials or lagging.
- Proper measures shall be taken to protect the water pipe outside the boiler from getting frozen.
- Proper measures shall be taken for boiler combustion to be protected against snow, rain and wind.

4 Electric wiring installation

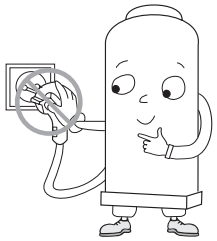
⚠ Warnings



The electric wiring installation shall be performed to comply with the power supply of the product.

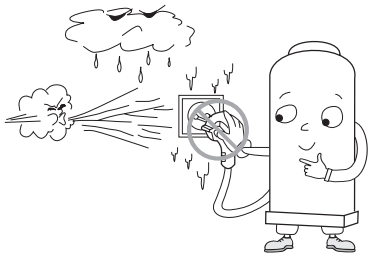
- The power supply, if higher or lower than the one specified on the name plate on the front of the boiler, may cause a fire.

⚠ Cautions



Do not connect the power supply to the boiler until the electric wiring installation is completed.

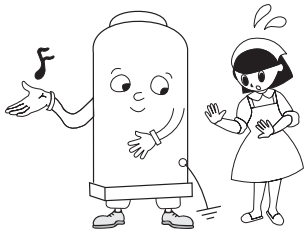
- With the power supply on, the electricity flowing through the boiler may cause an electric shock.



Install the power outlet in a place free from the impact of rain and moisture.

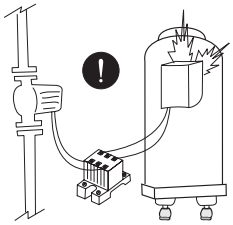
- Electric leakage, possibly resulting from rain and moisture, may cause a fire.

⚠ Attention



Never make a ground connection to the lightning rods and the gas pipe.

- Ground connection to the lightning rod may result in a boiler malfunction.
- Ground connection to the gas pipe may result in an explosive accident.



Be sure to use the magnet switch for connection of the circulation pump with more than 1.5kW.

- The boiler may malfunction, without the magnet switch.

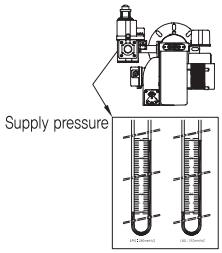
Correct electric wiring installation

- Install the electric wiring as presented in the electric wiring drawing in the installation manual.
- Install the dedicated power outlet for the boiler, with a length of less than the effective length of the power cord. Installation shall be made for the power outlet not to get in contact with the drain valve of the boiler.
- Use the power outlet with a cover attached, and install the outlet at more than 300m above ground level.
- If the power outlet is not provided with a cover, install the outlet in a place free from the impact of rain or moisture, or in the waterproof box or the indoor distribution box.
- Never install a switch onto the power cord, nor use the power outlet with a switch attached. (The boiler does not operate, when the switch is set at off.)
- A ground connection shall be installed, if not, on the side of the power outlet.
- The wires of the room temperature controller shall be connected through the insulation pipe with a thickness of more than 4mm. The insulation pipe shall be installed and concealed with an upper gradient toward the indoors.

! The wires of the circulation pump, connected to the controller, shall not be short-circuited.

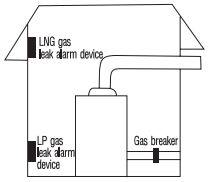
5 Gas piping installation

⚠ Danger



Be sure to perform the gas leak test after gas pipe installation, replacement of the burner, or the supply pressure or head pressure test.

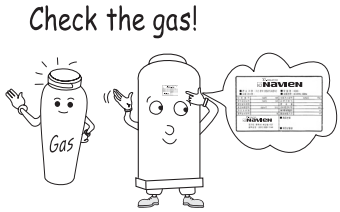
- Retention of the leaked gas, combined with static electricity or spark, may cause a fire



In preparaion for the unexpected gas leak, be sure to install the gas leak alarm device and the gas breaker in the boiler room.

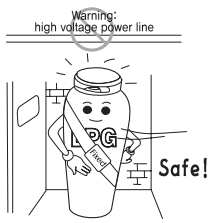
- Retention of the leaked gas, combined with static electricity or spark, may cause a fire

⚠ Warnings



Be sure to check the gas to be used for the product prior to gas piping installation.

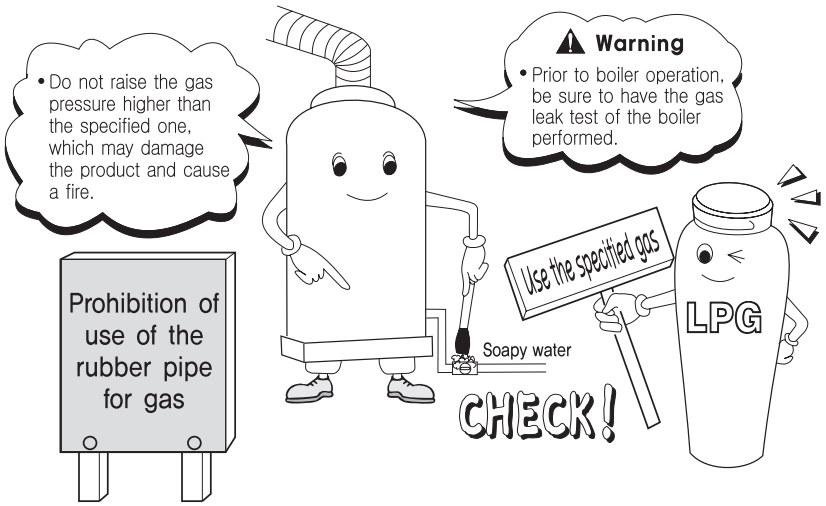
- Use of the gas, other than the one specified on the name plate on the front of the boiler, may cause incomplete combustion, eventually leading to a fire or explosive ignition.



Install the gas holder, if used, in the well-ventilated outdoor without above ground high voltage power line. The gas holder shall be fixed not to fall down on the ground.

- If the gas holder falls down or gets in contact with the high voltage power line, an explosive accident may occur.

The gas piping installation shall be performed by the gas company and the gas piping installation company.


• Do not raise the gas pressure higher than the specified one, which may damage the product and cause a fire.
Warning
• Prior to boiler operation, be sure to have the gas leak test of the boiler performed.
Prohibition of use of the rubber pipe for gas
Use the specified gas
LPG
Soapy water
CHECK!

1 Refer to the "Specifications" presented in this installation manual, with regard to the connection size.

2 Use the metal pipe or the metal flexible pipe which passed a gas appliance test for gas piping. When LP gas is used, never install the fuse cock, and be sure to install the gas middle valve. (Installation of the fuse cock may cause a boiler malfunction.)

3 The following shall be kept in mind, when using LP gas.

- The domestic low pressure regulator, appropriate for the indicated gas consumption, shall be used as the LP gas regulator.
- 2 or more vessels with a weight of 50kg shall be installed to be used for the LP gas vessel. (Connect the twin valve to simultaneously supply the gas from 2 vessels.)

※ The vessels with a small capacity may result in gas loss for lack of vaporization volume, which may cause a boiler malfunction.

4 Be sure to connect the gas pipe directly to the main pipe. Never connect the gas pipe in common with other gas appliances.

5 A separable union connection or a nut connection shall be made on the connection points.

6 The gas pipe shall be installed with its surface exposed to the outside. However, the copper pipe, the stainless steel pipe, or other pipes made of heat- and corrosion-resistant materials without connection joints (except for welding joints) may be buried for installation.

7 Be sure to install the gas leak alarm device and the gas breaker in the boiler room.

- LP gas: lower than the boiler (300mm above the ground level)
- LNG : higher than the boiler

Piping materials

The piping materials shall comply with the Korea Standard.

Gas pipe	Carbon steel pipe for fuel gas piping, Copper or copper alloy pipe, Metal flexible pipe which passed the gas appliance test
Heating pipe	Copper or copper alloy pipe + Insulation, XLPE pipe + Insulation
Hot water pipe	Copper or copper alloy pipe + Insulation, XLPE pipe + Insulation

Piping installation

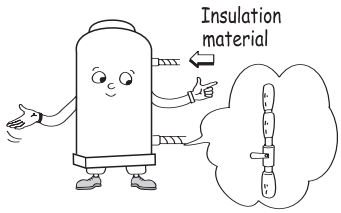
Items	Distance from the gas pipe
Flue pipe & chimney	300mm or more
Electric switch, Power outlet	300mm or more
Electricity meter, Safety cutout	600mm or more
Wire	150mm

Fixing the pipe

Size of the pipe	Interval
13mm or less	To fix every 1m
13mm~33mm	To fix every 2m
33mm or more	To every 3m

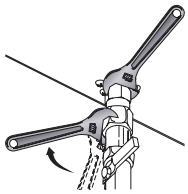
6 Heating and hot water piping installation

⚠ Attention



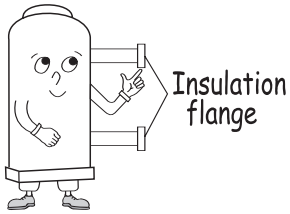
The exposed pipes shall be heat insulated with the insulation material.

- The exposes pipes may get frozen in the winter.
- If the water supply pipe is frozen, the hot water is not supplied. When the heating pipe has run out of water, the water is not supplemented. Consequently, the boiler can not operate normally.



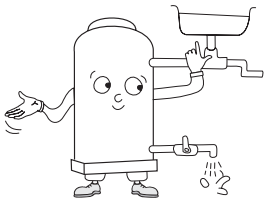
Fix the parts of the boiler pipes with appropriate tools, prior to piping installation.

- Do not exert excessive force on the pipe during the installation, Damages on the parts may cause a water leak.



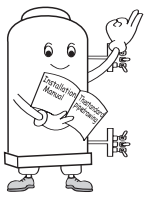
Be sure to use the insulation flange on the heating inlet and outlet in case of installation of the copper pipe (the hot water inlet and outlet for a boiler dedicated for hot water supply).

- Failure to use the insulation flange may cause rapid corrosion (rusty water).
- We do not take the responsibility of the problems arising from failure to use the insulation flange.



Do not use water, other than the tap water, for the boiler.

- Salt content in the sea water or spa water may accelerate corrosion and shorten the life of the boiler.
- We do not take the responsibility of the problems caused by using water, other than the tap water.



Install the pipes as illustrated in the standard pipe drawing.

- Failure to install the pipe as illustrated in the standard piping drawing may deteriorate the efficiency of the boiler and the circulation of the heating water, which may result in a boiler malfunction.

Precautions for piping installation

Considerations in common

- A separable union connection or a nut connection shall be performed on the connection points.
- The piping materials shall comply with the Korea Standard.
- Do not use the metals with different electric potentials to install the piping in the dedicated boiler for hot water supply, (For example, do not install the copper pipe in the iron boiler.) which may cause galvanic corrosion, eventually generating rusty water.
- Do not use the rubber hose for the faucet, when installing the piping.
- Be sure to remove foreign objects inside the pipe prior to the piping installation.
- Install the piping correctly for the water supply, the hot water supply, the heating, and the drain.
- The heating pipe shall be equipped with the heating strainer.
- If the water supply pressure exceeds the allowable working pressure specified on the name plate, be sure to install the depressurizing valve.
- Proper measures shall be taken against a water leak through a water leak test for the entire piping after completion of installation.
- The entire pipelines, except for the gas pipe, shall be provided with heat insulation to protect against getting frost, after completion of installation. (Especially, care shall be taken for the water supply and the hot water pipes.)
- Be sure to install the pressure release pipe for installation of the boiler. If it is impossible to install the pressure release pipe, the safety valve, operating below the maximum allowable working pressure of the boiler, shall be installed.
  (The maximum allowable working pressure of the boiler is presented in the "Specifications".)
- Never install the valve and the check valve in the pipeline where the pressure release pipe or the safety valve is installed.
- Select the boiler expansion tank, if necessary, with a capacity suitable for the boiler in use.
- Do not use the water inlet for the purpose of the drain, and vice versa.
- If the water is supplied to the boiler from the rooftop water tank, be sure to install the water supply pipe in the auxiliary tank, separate from the rooftop water tank, for water supply to the boiler.
- Install the pipes as illustrated in the standard pipe drawing.

Precautions for the piping installation for the combi boiler for heating and hot water supply / the dedicated boiler for heating

■ Model no. : KDB-535, 735 GTD, GTS
KDB-535, 735, 1035, 1535, 2035 GPD, GPS

• Open piping system

- Be sure to comply with the instructions presented in the “Considerations in common”.
- Be sure to install the air vent valve in the distributor.
- The return water distributor shall be installed below the heating inlet on the boiler.
- The pressure release pipe shall be installed to exceed 25A.
- Never supply the water with a pressure higher than the maximum allowable working pressure of the boiler specified on the name plate, nor connect the water pipe directly for the piping.
- The reverse flow of the heating water into the expansion tank, while operating or stopping the circulation pump, results from too much air in the pipe. (Open the valve in the distributor one by one and remove the air from the pipe, while operating the circulation pump.)
- The expansion tank shall be installed at least 1.5m above the heat dissipation surface in case of the upward type, and at least 1.5m above the top of the boiler in case of the downward type.
- The piping installation shall be performed not to mix the heating water and the hot water.

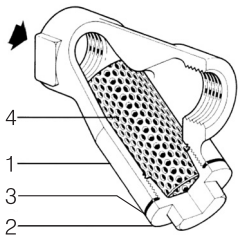
• Closed piping system

- Be sure to comply with the instructions presented in the “Considerations in common”.
- Be sure to install the strainer, the depressurizing valve, the check valve, and the closed expansion tank, in order to directly connect the boiler to the water pipe.
- Be sure to install the depressurizing valve and the check valve in the water supply pipe.
- Install the air vent on top of the heat dissipation surface to facilitate air vent.
- Be sure to install the strainer in the water supply pipe, in order to prevent metal and foreign objects from flowing into the water supply pipe.
- Be sure to install the safety valve.
- Be sure to install the closed expansion tank with an appropriate capacity.

STRAINER

■ Composition

1. Body
2. Cap
3. Cap gasket
4. Strainer screen



■ Features: The device is to remove foreign objects in the boiler and the heating pipeline.

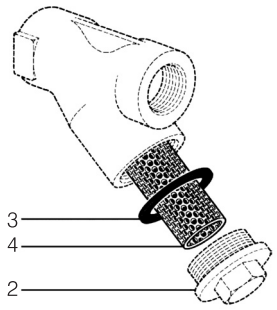
1. Prevention of corrosion in the pipe: The portion of accumulated foreign objects inside the pipe gets corroded first. Accordingly, the foreign objects shall be strained to prevent corrosion.
2. Extension of the boiler life: The accumulated foreign objects obstruct heat transfer, and the accumulated portion is overheated, which shortens the life of the boiler. Consequently, the foreign objects shall be strained to extend the boiler life.
3. Protection of main equipment: The heating circulation pump, the valve, and other equipment are protected from being damaged by foreign objects.

■ Installation method

1. Install the strainer in the direction of the heating water flow, as indicated in the body of the heating strainer.
2. You may install the strainer in a horizontal or vertical direction, as desired.
3. Install the valves on each end of the heating strainer, in order to prevent the heating water from draining during cleaning of the strainer.
4. The pocket shall be installed to face the ground surface, and a sufficient space shall be provided for cleaning the strainer.

■ The method of cleaning (Removal of foreign objects)

1. Close the valves on each side of the strainer, to completely shut off the heating water.
2. Open the cap to remove the foreign objects on the strainer screen.(! Caution: Care shall be taken against a burn, possibly caused by the heating water.)
3. After cleaning, check if there is a leak of the heating water. Then, open the valve to use the strainer.
4. The heating strainer shall be cleaned periodically. At the beginning of use, foreign objects usually remain in the pipe, which shall be cleaned out.



Precautions for the piping installation for the dedicated boiler for hot water supply

■ Model no.: KDB-535, 735 GTG
KDB-1035, 1535, 2035 GPG

• Open piping system

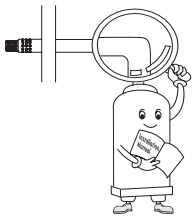
- Be sure to comply with the instructions presented in the “Considerations in common”.
- Never supply the water with a pressure higher than the maximum allowable working pressure of the boiler specified on the name plate, nor connect the water pipe directly for the piping.
- Be sure to use the coated piping material and the stainless piping material for the dedicated boiler for hot water supply.
- The pressure release pipe shall be installed to exceed 25A.
- The expansion tank shall be installed at least 1.5m above the maximum height of the hot water pipe in case of the upward type, and at least 1.5m above the top of the boiler in case of the downward type.
- When installing the hot water storage tank, connect the hot water outlet to lower part (inlet) of the hot water tank, and the hot water inlet to the upper part (outlet) of the hot water tank.
- Use the connection wire to the circulation pump of the boiler to install the hot water storage tank separately.
- If the water pressure is too low, attach an additional pump to the hot water outlet.
- When attaching an additional pump, be sure to install the pressure switch (S/W) and the check valve. (Do not connect them to the wire of the circulation pump of the boiler.)

• Closed piping system

- “Be sure to comply with the instructions presented in the “Considerations in common”.
- Be sure to install the strainer, the depressurizing valve, the check valve, the safety valve, and the closed expansion tank, in order to directly connect the boiler to the water pipe.
- Be sure to use the coated piping material and the stainless piping material for the dedicated boiler for hot water supply.
- Be sure to install the depressurizing valve and the check valve in the water supply pipe.
- Install the air vent on top of the hot water supply pipe to facilitate air vent.
- Be sure to install the safety valve.
- Be sure to install the closed expansion tank with an appropriate capacity.
- When installing the hot water storage tank, connect the hot water outlet to lower part (inlet) of the hot water tank, and the hot water inlet to the upper part (outlet) of the hot water tank.
- Use the connection wire to the circulation pump of the boiler, in order to install the hot water storage tank separately.
- If the water pressure is too low, attach an additional pump to the hot water outlet.
- When attaching an additional pump, be sure to install the pressure switch (S/W) and the check valve. (Do not connect them to the wire of the circulation pump of the boiler.)

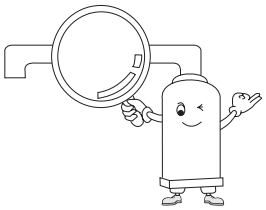
7 Exhaust / Intake vent installation

⚠ Warnings



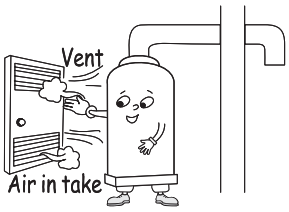
Installation of the exhaust and intake chimney pipe (chimney) shall be performed in a specified method.

- Incorrect installation of the exhaust and intake chimney pipe (chimney) may lead to an exhaust gas poisoning.



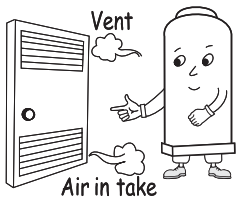
The connection points of the exhaust and intake pipes shall be free from any leakage.

- The exhaust gas, if flowing into the indoors, may cause carbon oxide poisoning.



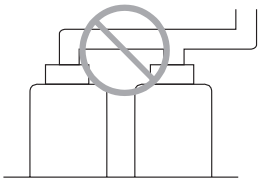
The air intake or the exhaust vent shall be installed in the outdoors or a well-ventilated place where the exhaust gas emitted from the vent does not flow into the indoors.

- The exhaust gas, if flowing into the indoors, may cause carbon oxide poisoning.



Be sure to install the air intake and the exhaust vent.

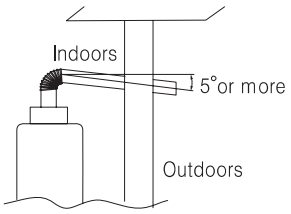
- Failure of ventilation may lead to incomplete combustion due to oxygen deficiency, which may eventually result in carbon oxide poisoning.



The boiler of the forced exhaust type (FE) can not employ the multiple exhaust ducts.

- The reverse flow of the exhaust gas may cause carbon oxide poisoning.

⚠ Warnings

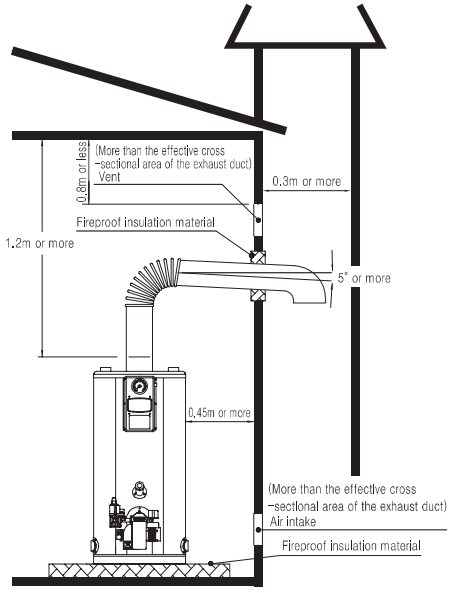


The horizontal section of the chimney pipe shall be installed to be inclined downward at an angle of 5°, to prevent the condensed water or rain from flowing in reverse into the boiler.

- Flow of the condensed water or rain into the boiler may deteriorate the performance of the boiler and shorten the life of the boiler.

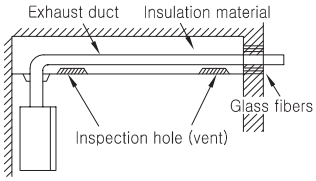
Installation of the chimney pipe for the forced exhaust type (FE) boiler

- The exhaust duct type of the forced exhaust type (FE) boiler: the single exhaust type, the chamber type, the shared exhaust type
- The total length of the exhaust duct shall be kept to 10m or less, and the curved parts to 3 segments or less. (except for the curve on the edge point of the exhaust duct)
- The connection size of the exhaust duct shall comply with the specifications. (Refer to the specifications.)
- Care shall be taken to prevent the middle part of the exhaust duct from getting narrower. The exhaust duct shall be installed to keep the radius of the curved part at maximum as possible.
- The exhaust duct shall be heat insulated with the non-flammable insulation material.


0.8m or less
(More than the effective cross -sectional area of the exhaust duct)
Vent
0.3m or more
Fireproof insulation material
1.2m or more
5° or more
0.45m or more
(More than the effective cross -sectional area of the exhaust duct)
Air intake
Fireproof insulation material

Installation of the chimney pipe

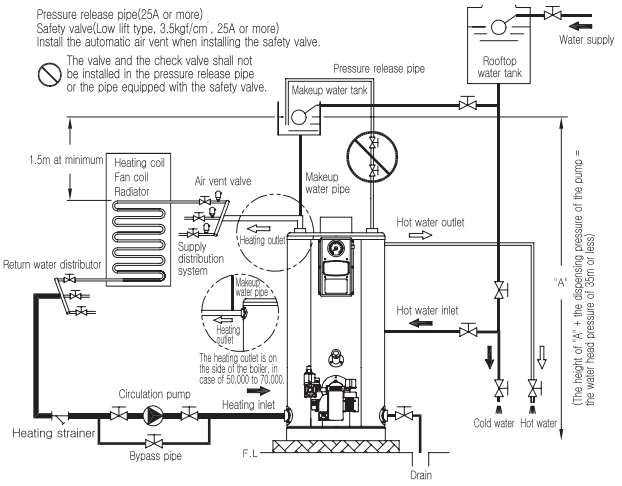
- The exhaust duct shall be made of the stainless steel (pipe) or the heat- and corrosion-resistant metal.
- The exhaust duct shall be connected, if necessary, to the boiler tightly not to be pulled out or shaken.
- If the exhaust duct passes through the combustible wall or the ceiling made of combustible material, the exhaust duct shall be heat insulated with a non-flammable material with a thickness of more than 20mm, and kept at least 50mm away from the wall or the ceiling. In addition, the exhaust duct, if passing through the ceiling, shall be equipped with the inspection hole.
- The exhaust duct shall be installed as a single unit, if possible. Never use the exhaust duct in common with the heaters of the natural exhaust type or those using other fuel (briquette, petroleum).
- The air intake shall be provided in a well-ventilated place such as the outdoors, into which the exhaust gas emitted from the exhaust duct does not flow.
  (※ Make sure that failure of air intake and ventilation causes oxygen deficiency, eventually leading to incomplete combustion.)
- Bore holes in the wall to install the vent on the upper side of the wall and the air intake on the lower side, to facilitate ventilation.
- The effective cross-sectional area of the air intake or the vent shall be larger than that of the exhaust duct.
- The bird protection net shall be installed on top of the exhaust duct so that birds, mice or objects with a diameter of more 16mm can not go into the exhaust duct.
- A space of more than 300mm shall be provided between the top of the exhaust duct and the outer wall surface, if non-flammable.
  - If the exhaust duct is to be installed and concealed into the ceiling, the connection points shall be securely connected to prevent exhaust gas leakage. Then, wind a non-flammable material, other than the metal, around the connection points.
  - Finish the connection points using the heat resistant silicon (except for the plaster bandage).
  - Install the inspection hole to check and repair the exhaust pipe in a dark side.



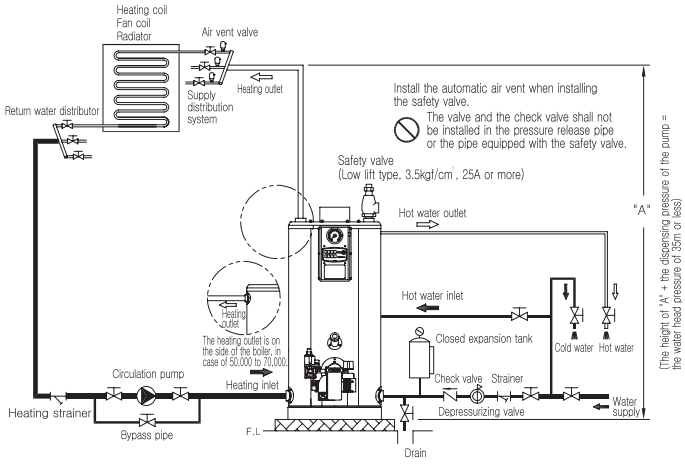
  - In order to extend the exhaust pipe, install one hanger at least every 900mm and tighten the installed hangers securely. (in case of the pipe extension with a length of more than 1m)
  - Incorrect installation of the exhaust pipe may cause deteriorated performance of the product as well as a disaster. Consequently, the installation shall be performed in accordance with this manual.

Standard piping drawing

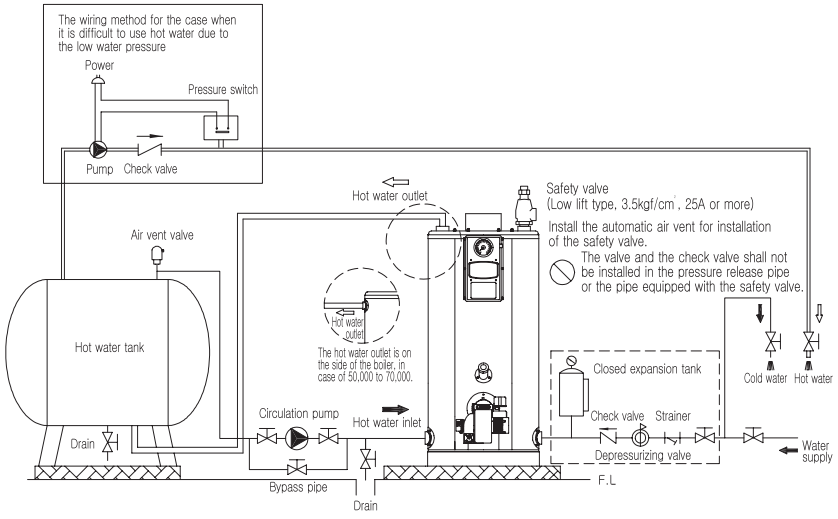
Combi boiler for heating and hot water supply- "Open expansion tank"


Pressure release pipe(25A or more)
Safety valve(Low lift type, 3.5kgf/cm , 25A or more)
Install the automatic air vent when installing the safety valve.
The valve and the check valve shall not be installed in the pressure release pipe or the pipe equipped with the safety valve.
Water supply
Rooftop water tank
Pressure release pipe
Makeup water tank
1.5m at minimum
Heating coil
Fan coil
Radiator
Air vent valve
Makeup water pipe
Hot water outlet
Heating outlet
Supply distribution system
Return water distributor
"A"
(The height of "A" + the dispensing pressure of the pump = the water head pressure of 35m or less)
Hot water inlet
Heating outlet
The heating outlet is on the side of the boiler, in case of 50,000 to 70,000.
Circulation pump
Heating inlet
Heating strainer
Bypass pipe
F.L
Cold water
Hot water
Drain

Combi boiler for heating and hot water supply- "Closed expansion tank"


Heating coil
Fan coil
Radiator
Air vent valve
Heating outlet
Supply distribution system
Return water distributor
Install the automatic air vent when installing the safety valve.
The valve and the check valve shall not be installed in the pressure release pipe or the pipe equipped with the safety valve.
Safety valve
(Low lift type, 3.5kgf/cm , 25A or more)
Hot water outlet
"A"
(The height of "A" + the dispensing pressure of the pump = the water head pressure of 35m or less)
Hot water inlet
Heating outlet
The heating outlet is on the side of the boiler, in case of 50,000 to 70,000.
Closed expansion tank
Cold water
Hot water
Circulation pump
Heating inlet
Check valve
Strainer
Heating strainer
Bypass pipe
Depressurizing valve
Water supply
F.L
Drain

Dedicated boiler for hot water supply
“Closed expansion tank”


The wiring method for the case when it is difficult to use hot water due to the low water pressure
Power
Pressure switch
Pump
Check valve
Hot water outlet
Safety valve
(Low lift type, 3.5kgf/cm , 25A or more)
Install the automatic air vent for installation of the safety valve.
The valve and the check valve shall not be installed in the pressure release pipe or the pipe equipped with the safety valve.
Air vent valve
Hot water outlet
The hot water outlet is on the side of the boiler, in case of 50,000 to 70,000.
Hot water tank
Closed expansion tank
Cold water
Hot water
Circulation pump
Hot water inlet
Check valve
Strainer
Drain
Depressurizing valve
Water supply
Bypass pipe
F.L
Drain

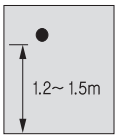
Installation Manual

8 Installation of the temperature controller

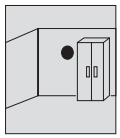
Installation place

■ Install the temperature controller on the wall of the room to be provided with frequent indoor heating.
The temperature controller shall be installed 1.2m to 1.5m above the floor, with sufficient air circulation.

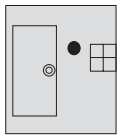
■ Do not install the controller in a place nearby the frequently opened door, or where cold wind blows, or under direct sunlight, or easily accessible by children.
(The example of the installation place, ● : Temperature controller



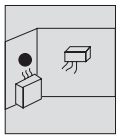
(○) A room with sufficient air circulation. A place free from the impact of hot air from the heating equipment.



(×) A place without air ventilation.



(×) Nearby the window or the door under the impact of a draft.

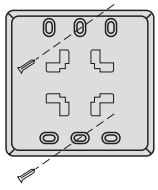


(×) A place directly under the impact of the heat sink or hot air.

Installation method

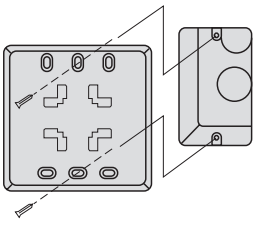
1. Connect 2 temperature controller wires from the boiler to 2 wires on the rear side of the temperature controller securely.
2. Fix the bracket of the temperature controller onto the desired position on the wall, or into the holes of the wall outlet using a bolt.
3. Install the temperature controller by hanging the connection wire onto the bracket carefully in the desired direction.

To fix the bracket onto the desired position on the wall



Bracket

To fix the bracket into the wall outlet



Bracket

Note : Do not exert excessive force while connecting the wire, and secure the bolt tightly. Pushing the temperature controller upward will separate the temperature controller and the bracket. If the cover of the wire peels off or the terminal connection is inferior, the temperature controller may not function normally. Consequently, care shall be taken for the insulation treatment of the temperature controller.

9 Check points for test operation

1) Check if the boiler is installed correctly.

① Check if the floor surface is made of strong and flat non-flammable materials such as concrete and if the surrounding area is also made of non-flammable materials.

② Check the air intake and vent in the boiler room.

③ Check if the boiler room is provided with a drain, and if the boiler is equipped with the drain valve.

④ Check if the boiler and the pipeline are heat insulated to prevent frost damage.

⑤ Check if the flue pipe is correctly installed.

⑥ Check if rain does not permeate through the penetration portion of the exhaust pipe.

⑦ Check if the boiler is evenly installed.

⑧ Check if there is water leakage near the piping connection joint.

⑨ Check if there is any leakage near the gas pipe connection joint.

⑩ Check if the boiler room is equipped with the gas leak alarm device and the gas breaker.

- The location of installation of the gas leak alarm device
  LNG : 300mm from the ceiling
  LPG : 300mm from the floor

⑪ Check if the fuel is the same as the gas specified on the name plate of the boiler.

⑫ Check if the pressure release pipe or the safety valve are installed in the boiler.

⑬ Check if the ground wire is connected. (If the ground connection is made on the fuel pipe or the lightning rod, change the position.)

Test operation

1) Open the water supply valve to supplement water in the boiler.
   The water supply pressure shall be kept to less than the allowable working pressure, specified on the name plate of the boiler.
   - Upon completion of water supplement, the makeup water lamp on the controller goes out.

2) Connect the boiler to the power supply.

   Do not touch the power cord with wet hands.

3) Push the power switch of the boiler controller to on.

4) Open the valve on the fuel line.

5) Set the room temperature controller S/W at the operation mode.

6) After ignition of the boiler, check the combustion mode and the heating circulation mode.

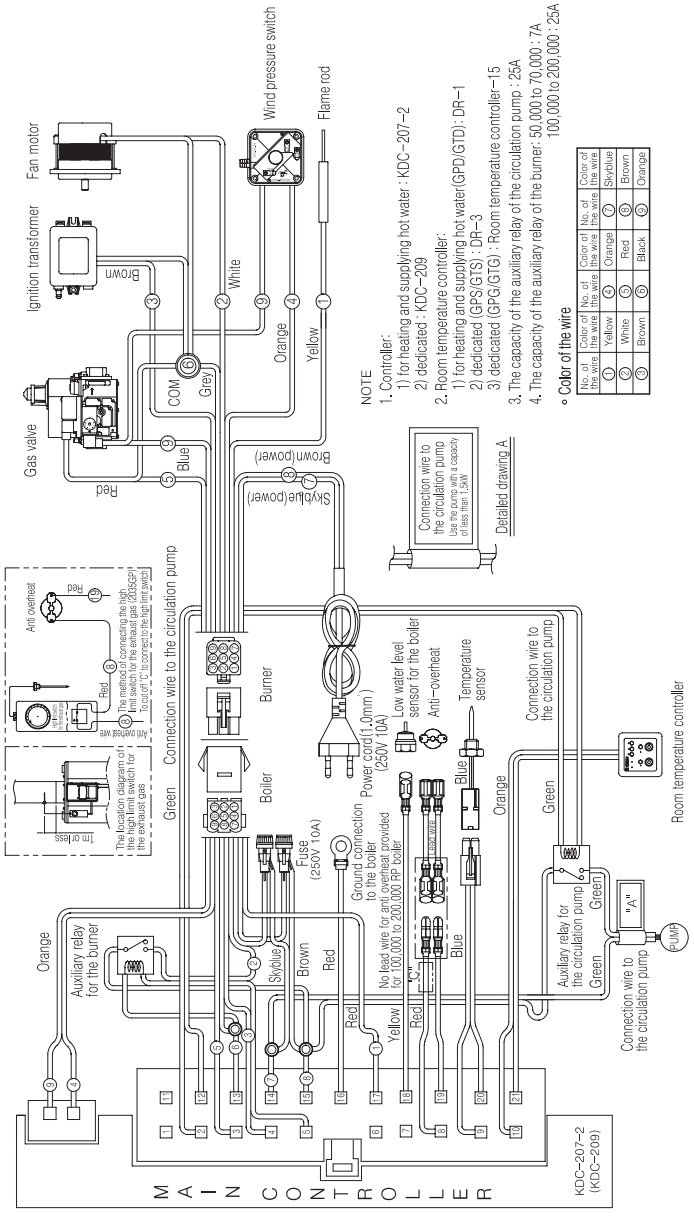
   ① Set the temperature on the temperature controller → Set the room temperature controller button (High speed, Temperature, Time) at ON → Operation of the burner fan → Check the gas pressure → Check the wind pressure → Operation of the ignition transformer → Open the 1st and 2nd gas valve → Ignition → Flame detection → Combustion → ON/OFF in accordance with the temperature setting (operation of the circulation pump)

   ② Check if the boiler stops operation and the circulation pump is operating, by adjusting the temperature controller from the boiler controller.

7) Press the “Hot water” button on the room temperature controller (DR-1), in order to check if the circulation pump stops operation and hot water is supplied.

8) Press the “Outside” button on the room temperature controller to check if the boiler stops operation.

10 Electric Wiring Diagram



No. of the wire	Color of the wire	No. of the wire	Color of the wire	No. of the wire	Color of the wire
①	Yellow	④	Orange	⑦	Skyblue
②	White	⑤	Red	⑧	Brown
③	Brown	⑥	Black	⑨	Orange

11 Specifications

1) Stainless boiler

Classification \ Model no.			535GTD	535GTS	535GTG	735GTD	735GTS	735GTG
Heating output		kcal/h (kW)	50,000 (58.1)	50,000 (58.1)	-	70,000 (81.3)	70,000 (81.3)	-
Hot water output		kcal/h (kW)	50,000 (58.1)	-	50,000 (58.1)	70,000 (81.3)	-	70,000 (81.3)
Hot water supply capacity (△ 40℃)		ℓ/min	21	-	21	29	-	29
Purpose			Combi	Heating only	Hot water only	Combi	Heating only	Hot water only
Efficieny (Total)	LNG	%	92.3	92.2	92.2	92.6	92.8	92.8
	LPG	%	92.3	92.2	92.2	92.6	92.8	92.8
Fuel			City gas (13A), LP gas					
Maximim allowable working pressure		kgf/cm² (MPa)	3.5 (0.343)					
Heat transfer area		m^2	1.96			2.78		
Heating area		m^2	100	100	-	140	140	-
Volume of pipe water		ℓ	40	46	46	60	68	68
Weight		kg	100	93	93	110	102	102
Power supply			1 ϕ , 220V, 50Hz					
Burner Model no.			KPG-50A			KPG-70A		
Power consumption		W	143			208		
Gas pressure		mmH_2O	LN gas : 200^{+50}_{-100}, LP gas : 280±50					
Fuel consumption			LNG : 61,000kcal/h(70.9kW) LPG : 5.1kg/h(70.9kW)			LNG : 84,000kcal/h(97.6kW) LPG : 7kg/h(97.6kW)		
size	Width	Ng mm	547			547		
	Depth + Burner	mm	848			837		
	Height	mm	1,032			1,240		
Piping size	Heating inlet・Outlet	A	40	40	-	40	40	-
	Drain	A	40	40	40	40	40	40
	Discharge outlet	A	40	40	40	40	40	40
	Hot water inout・Outlet	A	20	−	40	20	−	40
	Gas inlet	A	15					
Chimney size		ϕ	148					
Exhaust gas		℃	250 or less					

※ The specifications presented in this manual is subject to change without notice for quality improvement.

2) Steel boiler

Classification \ Model			535GPD	535GPS	735GPD	735GPS
Heating output		kcal/h (kW)	50,000 (58.1)	50,000 (58.1)	70,000 (81.3)	70,000 (81.3)
Hot water output		kcal/h (kW)	50,000 (58.1)	-	70,000 (81.3)	-
Hot water supply capacity(△ 40℃)		ℓ/min	21	-	29	-
Purpose			Combi	Heating only	Combi	Heating only
Efficiency (Total)	LNG	%	92.6	92.7	92.8	92.8
	LPG	%	92.6	92.7	92.8	92.8
Fuel			City gas (13A), LP gas			
Maximum allowable working pressure		kgf/cm² (MPa)	3.5 (0.343)			
Heat transfer area		m²	2.34		3.10	
Heating area		m²	100	100	140	140
Volume of pipe water		ℓ	56	63	72	85
Weight		kg	151	146	180	173
Power supply			1 ϕ , 220V, 50Hz			
Burner Model no.			KPG-50A		KPG-70A	
Power consumption		W	143		208	
Gas pressure		mmH_2O	LP gas: 280±50, LNG : 200^{+50}_{-100}			
Fuel consumption			LNG : 61,000kcal/h(70.9kW), LPG : 5.1kg/h(70.9kW)		LNG : 84,000kcal/h(97.6kW), LPG : 7kg/h(97.6kW)	
Product size	Width	mm	547		547	
	Depth + Burner	mm	850		838	
	Height	mm	1,148		1,410	
Piping size	Heating inlet・outlet	A	40	40	40	40
	Drain	A	40	40	40	40
	Discharge outlet	A	40	40	40	40
	Hot water inlet・outlet	A	20	–	20	–
	Gas inlet	A	15			
Flue size		ϕ	148			
Exhaust gas		℃	250 or less			

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3) Steel boiler

Classifications \ Model			1035GPD	1035GPS	1035GPG	1535GPD	1535GPS	1535GPG
Heating Output		kcal/h (kW)	100,000 (116.2)	100,000 (116.2)	-	150,000 (174.4)	150,000 (174.4)	-
Hot water Output		kcal/h (kW)	100,000 (116.2)	-	100,000 (116.2)	130,000 (151.1)	-	150,000 (174.4)
Capacity of hot water supply (△ 40℃)		ℓ/min	42	-	42	54	-	63
Purpose			Combi	Heating only	Hot water only	Combi	Heating only	Hot water only
Efficiency (Total)	LNG	%	91.2	91.2	91.2	91.5	91.5	91.5
	LPG	%	91.2	91.2	91.2	91.5	91.5	91.5
Fuel			Citygas (13A), LP gas					
Maximum allowable working pressure		kgf/cm² (MPa)	3.5 (0.343)					
Heat transfer area		m²	3.32			4.77		
Heating area		m²	662	662	-	992	992	-
Volume of pipe water		ℓ	135	148	148	173	188	188
Weight		kg	267	248	248	390	370	370
Power supply			1 ϕ , 220V, 50Hz					
Burner Model no.			KPG-100A			KPG-150A		
Power consumption		W	224			232		
Gas pressure		mmH_2O	LP gas: 280±50, LNG : 200^{+50}_{-100}					
Fuel consumption			LNG : 124,000kcal/h(144.1kW) LPG : 10.3kg/h(144.1kW)			LNG : 178,000kcal/h(206.9kW) LPG : 14.8kg/h(206.9kW)		
Product Size	Width	mm	687			796		
	Depth + Burner	mm	994			1,094		
	Height	mm	1,403			1,411		
Piping size	Heating inlet・outlet	A	65	65	-	80	80	-
	Drain	A	65	65	65	80	80	80
	Discharge outlet	A	65	65	65	80	80	80
	Hot water inlet・outlet	A	20	−	65	20	−	80
	Gas inlet	A	20			25		
Flue size		ϕ	200					
Exhaust gas		℃	250 or less					

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4) Iron boiler

Classification \ Model			2035GPD	2035GPS	2035GPG
HeatingOutput		kcal/h (kW)	200,000 (232.5)	200,000 (232.5)	-
Hot waterOutput		kcal/h (kW)	130,000 (151.1)	-	200,000 (232.5)
Hot water supply capacity(△ 40℃)		ℓ/min	63	-	83
Purpose			Combi	Heating only	Hot water only
Efficiency (Total)	LNG	%	92.0	92.0	92.0
	LPG	%	92.0	92.0	92.0
			City gas (13A), LP Gas		
Maximum allowable working pressure		kgf/cm² (MPa)	3.5 (0.343)		
Heat transfer area		m²	6.46		
Heating area		m²	1323	1323	-
Volume of pipe water		ℓ	237	255	255
Weight		kg	475	450	450
Power supply			1 ϕ , 220V, 50Hz		
Burner	Model no.		KPG-200A		
Power consumption		W	366		
Gas pressure		mmH_2O	LP gas: 280±50, LNG : 200^{+50}_{-100}		
Fuel consumption			LNG : 24Nm³/h, 252,000kcal/h(293.0kW), LPG : 21kg/h		
Product size	Width	mm	796		
	Depth + Burner	mm	1,165		
	Height	mm	1,716		
Piping size	Hot water inlet・outlet	A	80	80	−
	Drain	A	80	80	80
	Discharge outlet	A	80	80	80
	Hot water inlet・outlet	A	20	−	80
	Gas inlet	A	32		
Flue size		ϕ	200		
Exhaust gas		℃	250 or less		

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